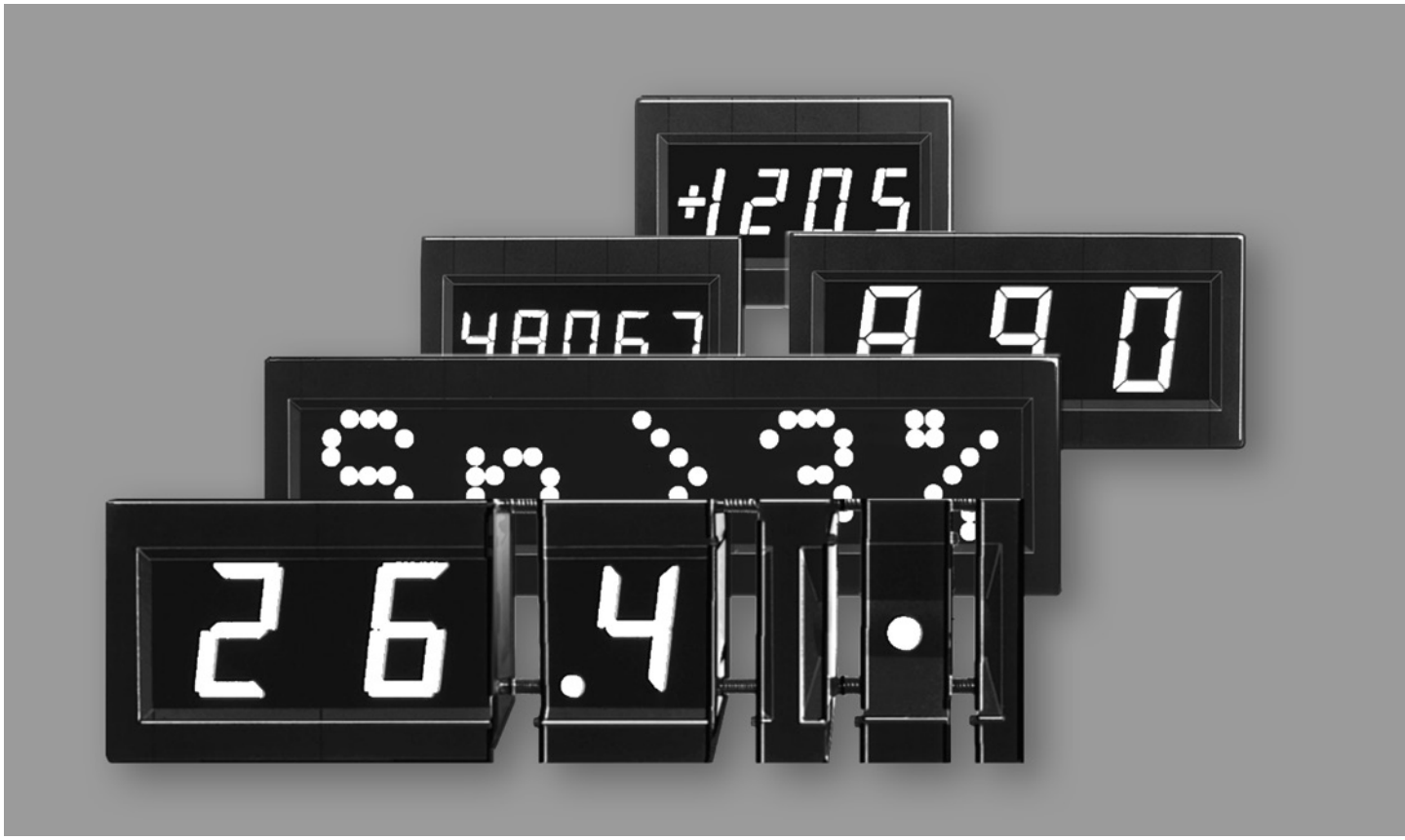
Manual



Series D65/D75/D72
Modular digital displays

Simple assembling of the display units

The modules are lined up as required, laterally completed by end brackets and screwed by two threaded rods. This assembling may be done at the factory. The assemblies (display units) are fixed into panels by snap-in.
In case of an extremely long assembly, to add spacers placed against one another in pairs at 150 to 200 mm intervals is recommended.
The spacers incorporate snap-ins, similar to the end brackets, for additional fixation in the panel cut-out.
A special feature of the modules is the high thermal reliability because the integrated circuits are located on the outside of the display housing. However, sufficient convection cooling should be provided when installed.
The ventholes in the display housing must not be covered.

Numeric display modules

These display modules are equipped with a 7 segment LED matrix.
They display the figures 0 to 9 and are driven in BCD code. For description of the modules see pages 4/5.

Hexadecimal display modules

Likewise equipped with a 7 segment LED matrix, these modules display A to F in addition to 0 to 9 and are driven in binary code. For description of the modules see page 4/5.

Alphanumeric display modules

These modules possess a 5x7 LED dot matrix making the display of alphanumeric characters possible. They are driven in ASCII code. For description of the modules see page 6.

Individual display units

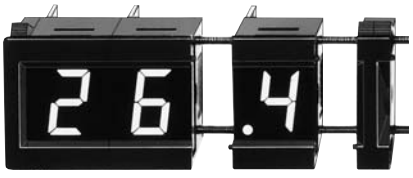
The series D65/D75/D72 make up a wide range of numeric, hexadecimal and alphanumeric display modules. Depending on the application, the modules can be combined to display units of several digits. Various housing sizes and character heights are available:

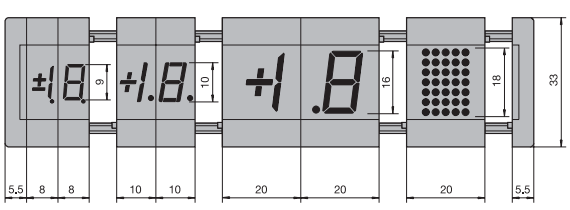
Series D65: Character height 9 mm
Module width 8 mm

Series D75: Character height 10 mm
Module width 10 mm

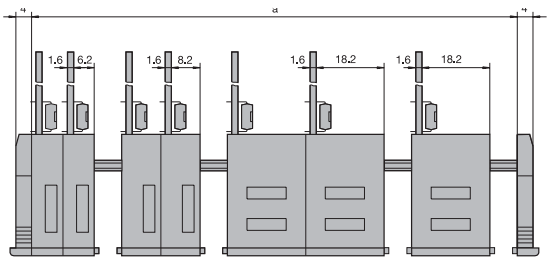
Series D72: Character height 16/18mm
Module width 20 mm

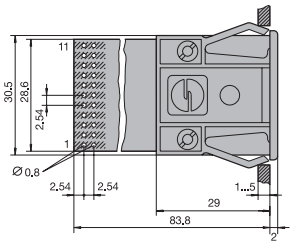
The module housings consist of matt black plastic.
Antireflective colour filters guarantee easy reading of the display, even with bright ambient light conditions. In all display modules figure 6 is represented in the correct style: 6 instead of b.



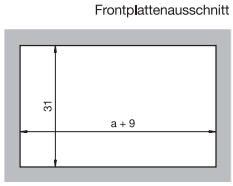


D65-... D75-... D72-... D72-422





Frontplattenausschnitt

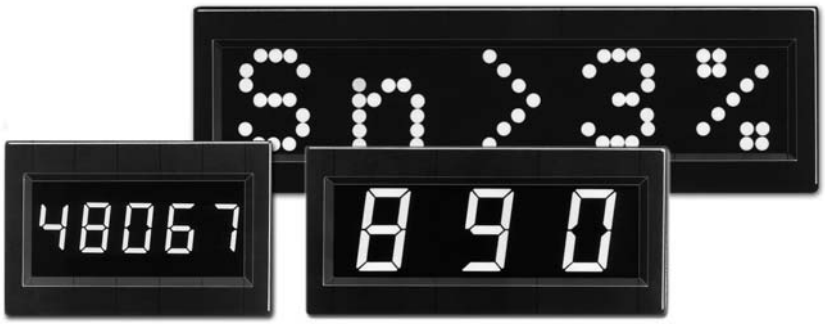


PLC compatible

The display modules are designed for 24V signal and supply voltages and are directly compatible with I/O ports of programmable logic controllers. The signal and supply voltages can be varied independently from one another within a wide range from 15 to 30 V.

Protection against reversed polarity

The power supply input of each display module is protected against reversed polarity. Further, the modules are available with Schmitt trigger inputs to increase the noise immunity.



Control by data bus

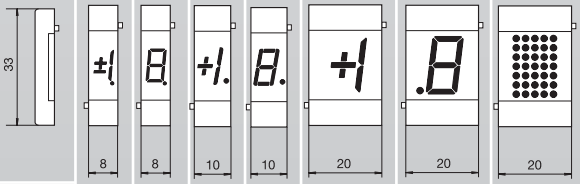
The display modules are equipped with a latch (display memory) allowing driving by a data bus or multiplexed signals.

Also for active low signals

For PLCs with NPN signal outputs, display modules with active low data inputs are available.
Description see pages 5/6.

▼ Type range

D65-14-R, D75-14-R and LED green unavailables



		Series D65		Series D75		Series D72			Display				Data input					Functions							
LED red	LED green								0...9	0...9/A...F	±1	alphanumeric	BCD	binary	+/-	ASCII	inverted	Schmitt trigger	Latch	Blanking	LED test	antireflective colour filters	Signal/supply voltage 24V	Protection against rev. pol.	Option active low input
Character height (mm)		9		10		16																			
Numeric display modules (0...9)																									
D65-13-R			■						■				■						■	■	■	■	■	■	■
D75-13-R					■				■				■						■	■	■	■	■	■	■
D72-13-R	D72-13-G						■		■				■						■	■	■	■	■	■	■
D72-413-R	D72-413-G						■		■				■					■	■	■	■	■	■	■	■
D72-415-R	D72-415-G						■		■				■				■	■	■	■	■	■	■	■	■
Polarity/overflow display modules (±1)																									
D65-14-R		■									■				■				■	■	■	■	■	■	■
D75-14-R				■							■				■				■	■	■	■	■	■	■
D72-14-R	D72-14-G					■					■				■				■	■	■	■	■	■	■
D72-414-R	D72-414-G					■					■				■			■	■	■	■	■	■	■	■
D72-416-R	D72-416-G					■					■				■		■	■	■	■	■	■	■	■	■
Hexadecimal display modules (0...9/A...F)																									
D72-4135-R	D72-4135-G						■			■				■				■	■	■		■	■	■	■
D72-4155-R	D72-4155-G						■			■				■			■	■	■	■		■	■	■	■
Alphanumeric display modules																									
D72-422-R								■				■				■		■	■	■		■	■	■	■

The modules possess a 7 segment LED matrix. The numeric versions display the figures 0 to 9, and the hexadecimal versions the characters A to F in addition. For applications with longer data lines between the display and the control, pin compatible modules with Schmitt trigger inputs are available; the Schmitt trigger versions are also available with inverted BCD/binary data inputs.

Technical data

Supply voltage: Ucc = +15...30 V DC
Supply current (all segments except the decimal point displayed):

D65-13, D75-13, D72-13, D72-413, D72-415, D72-4135 and D72-4155:
Ucc = 15V: typ. 60 mA, max. 71 mA
Ucc = 24V: typ. 50 mA, max. 62 mA
Ucc = 30V: typ. 40 mA, max. 52 mA

D65-14, D75-14, D72-14, D72-414 and D72-416:
Ucc = 15V: typ. 50 mA, max. 56 mA
Ucc = 24V: typ. 40 mA, max. 46 mA
Ucc = 30V: typ. 35 mA, max. 41 mA

Signal voltage:
L = -3,5...+3 V; H = +15...30 V

Input resistance: typ. 22 kΩ
Operating temperature: 0...55 °C

Character set standard and Schmitt trigger versions
D65-13, D75-13, D72-13, D72-413 (numeric 0...9)
D65-14, D75-14, D72-14, D72-414 (Polarity/overflow ±1)
D72-4135 (hexadecimal 0...9/A...F)

BCD/ binary-input A B C D	L L L L	H L L L	L H L L	H H L L	L L H L	H L H L	L H H L	H H H L	L L L H	H L L H	L H L H	H H L H	L L H H	H L H H	L H H H	H H H H
D65-13 D75-13 D72-13 D72-413	0	1	2	3	4	5	6	7	8	9	blank					
D65-14	±1		-1	-1	+	±1	+1	-	±1	±	blank					
D75-14 D72-14 D72-414	+1	-	+1	+1	-1	:1	1	+	+1	+1	blank					
D72-4135	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F

Character set Schmitt trigger versions with inverted BCD/binary data input
D72-415 (numeric 0...9); D72-416 (Pol./overfl. ±1); D72-4155 (hexadec. 0...9/A...F)

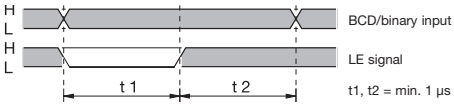
BCD/ binary-input $\overline{A}$ $\overline{B}$ $\overline{C}$ $\overline{D}$	H H H H	L H H H	H L H H	L L H H	H H L H	L H L H	H L L H	L L L H	H H H L	L H H L	H L H L	L L H L	H H L L	L H L L	H L L L	L L L L
D72-415	0	1	2	3	4	5	6	7	8	9	blank					
D72-416	+1	-	+1	+1	-1	:1	1	+	+1	+1	blank					
D72-4155	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F

Signal inputs

A B C D: BCD/binary data input
$\overline{A}$ $\overline{B}$ $\overline{C}$ $\overline{D}$: inverted BCD/bin. data input

LE - Latch Enable
L signal: The display follows the data on the BCD/binary data input.
H signal: The display remains although the data on the BCD/binary input changes.

After a signal change from L to H, the display stores the information received on the BCD/binary data input prior to the signal change. The decimal point is not stored. The LE signal must be 1 µs min. on L before the transition to H (t1). After the signal change, the information on the BCD/binary data input must stay for 1 µs min. (t2).



$\overline{LT}$ - LED Test
L signal: All segments except the decimal point are displayed, regardless of other data input conditions.
LT input omitted from D72-4135 and D72-4155.

$\overline{BI}$ - Blanking Input
L signal: Display blank, regardless of the BCD/binary and LE input conditons.
H signal: Display visible.

DP - Decimal Point
L signal: decimal point blank
H signal: decimal point displayed

Power supply
0V: Ground level of supply voltage and signals
Ucc: Positive terminal of the supply voltage, protected against reversed polarity.

Application data

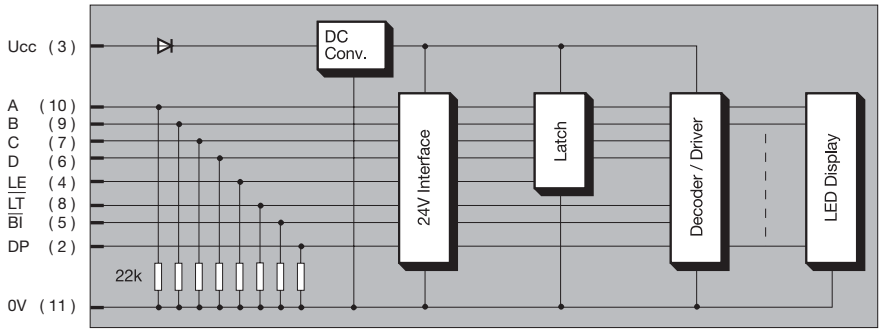
Unconnected data inputs will be evaluated as L signal (except D...-...S versions: evaluation as H signal).

If the inputs $\overline{LT}$ and $\overline{BI}$ are not used, they must be connected to H signal or Ucc (not necessary for versions D...-...S).

Standard versions

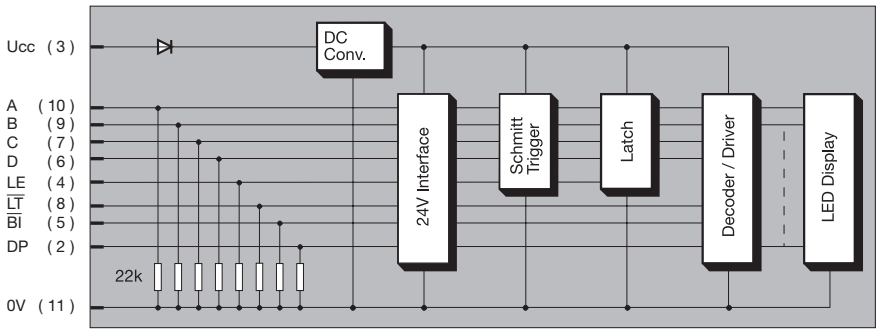
D65-13, D75-13, D72-13 (numeric 0...9)
D65-14, D75-14, D72-14 (Pol./overfl. ±1)
Input DP omitted from D72-14.

▼ Block diagram



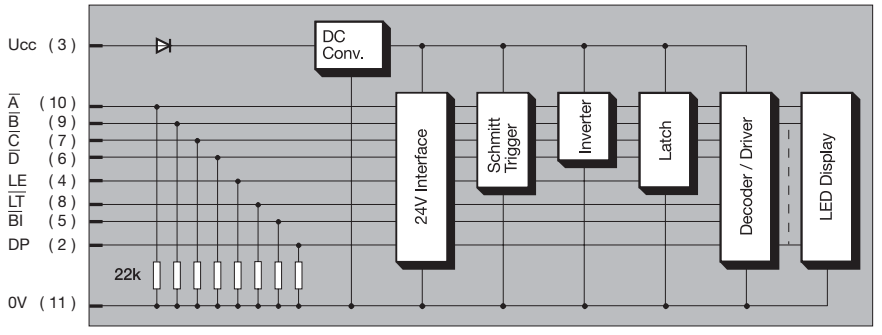
Schmitt trigger versions

D72-413 (numeric 0...9)
D72-414 (Polarity/overflow ±1)
D72-4135 (hexadecimal 0...9/A...F)
Input DP omitted from D72-414.
Input LT omitted from D72-4135.



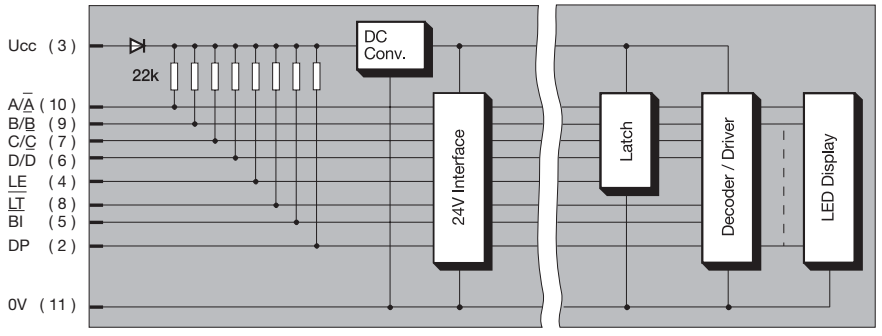
Schmitt trigger versions with inverted BCD/binary data input

D72-415 (numeric 0...9)
D72-416 (Polarity/overflow ±1)
D72-4155 (hexadecimal 0...9/A...F)
Input DP omitted from D72-416.
Input LT omitted from D72-4155.



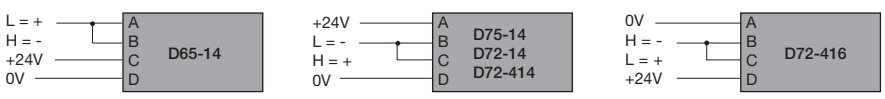
Versions with active low input

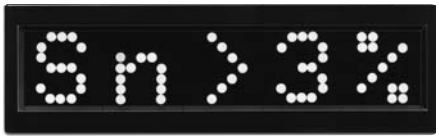
The signal inputs of these versions are connected to Ucc as opposed to 0V with internal resistors. Therefore, they are controllable with active low signals instead of active high signals. The reference number is: D...-...S
(e. g. D75-13S-G or D72-4135S-R).



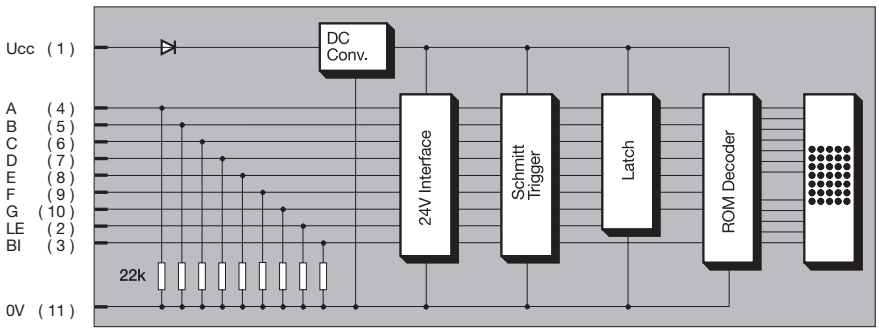
Application data

Control of polarity and overflow display

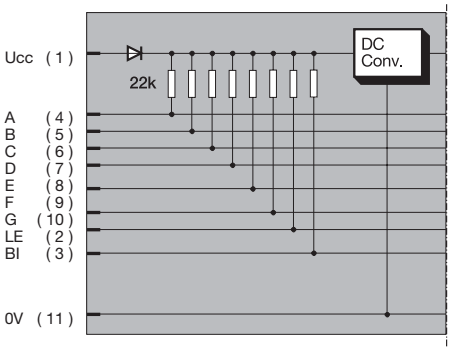




The display modules D72-422 are equipped with a 5x7 LED dot matrix and can display small and capital letters, numbers and special characters. The Schmitt trigger characteristic on all data inputs grants high noise immunity, even in cases of long data lines between control and display.



▲ Block diagram D72-422



Block diagram D72-422S ▶
The signal inputs of this version are connected to Ucc as opposed to 0V with internal resistors. Therefore, they are controllable with active low signals instead of active high signals.

▼ Character set

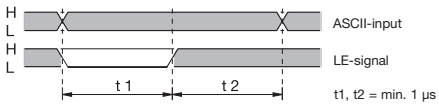
ASCII-input A B C D / G F E	L L L L	H L L L	L H L L	H H L L	L L H L	H L H L	L H H L	H H H L	L L L H	H L L H	L H L H	H H L H	L L H H	H L H H	L H H H	H H H H
L L L	blank															
L L H																
L H L		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
L H H	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
H L L	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
H L H	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
H H L	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
H H H	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	▒

Signal inputs

A...G (ASCII data input)

LE - Latch Enable
L signal: The display follows the data on the ASCII data input.
H signal: The display remains although the data on the ASCII input changes.

After a signal change from L to H, the display stores the information received on the ASCII data input prior to the signal change. The LE signal must be 1 µs min. on L before the transition to H (t1). After the signal change, the information on the ASCII data input must stay for 1 µs min. (t2).



BI - Blanking input
L signal: Display visible.
H signal: Display blank, regardless of the ASCII- and LE input conditions.

Power supply
0V: Ground level of supply voltage and signals.
Ucc: Positive terminal of the supply voltage, protected against reversed polarity.

Technical data

Supply voltage: Ucc = +15...30 V DC

Supply current:
Ucc = 15 V: typ. 85 mA, max. 106 mA
Ucc = 24 V: typ. 58 mA, max. 73 mA
Ucc = 30 V: typ. 51 mA, max. 64 mA

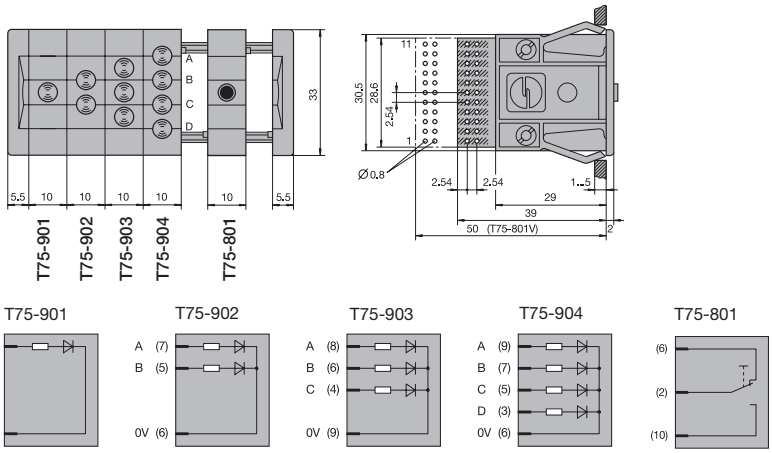
Signal voltage:
L = -3,5...+3 V; H = +15...30 V

Input resistance: typ. 22 kΩ
Operating temperature: 0...55 °C

Application data

Unconnected data inputs will be evaluated as L signal except D72-422S: evaluation as H signal).

Status indicators and push-button switch modules unavailables



The status indicators are available with 1 to 4 LEDs. The push-button switch modules contain a switch contact with a green button. Version T75-801V has an extended p. c. board with places for diodes.

Status indicators with 1 LED
LED red: T75-901-R-24
LED green: T75-901-G-24

Status indicators with 2 LEDs
LED red: T75-902-R-24
LED green: T75-902-G-24

Status indicators with 3 LEDs
LED red: T75-903-R-24
LED green: T75-903-G-24

Status indicators with 4 LEDs
LED red: T75-904-R-24
LED green: T75-904-G-24

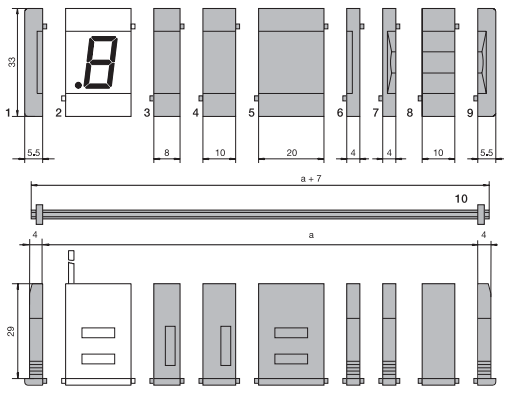
Push-button modules
T75-801-G
T75-801V-G

Technical data

Status indicators
Signal voltage: H = +20 ... 28 V DC
Supply current per LED: typ. 12 mA
Operating temperature: 0 ... 55 °C

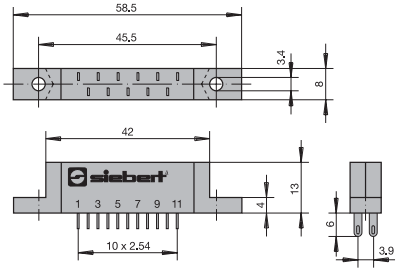
Push-button modules
Electrical rating (resistive load):
0,1 A, 50 V AC/DC

Accessories

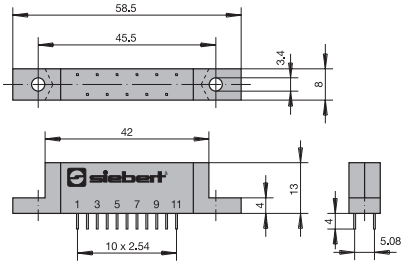


Connectors are available with soldering lugs for wiring or with soldering pins for p. c. boards. Their pins are arranged in dual-in-line for easy wiring.

Connectors with soldering lugs
Reference number 504.021



Connectors with soldering pins
Reference number 504.023



1 Display end bracket
Reference number 504.003
2 Display module
3 Display spacer 8 mm
Filter red: D65-00-R
4 Display spacer 10 mm
Filter red: D75-00-R
5 Display spacer 20 mm
Filter red: D72-00-R
6 Display separate plate
Reference number 504.004
7 Switch separate plate
Reference number 504.002
8 Switch spacer 10 mm
Reference number T75-00
9 Switch end bracket
Reference number 504.001
10 Threaded rods with 2 nuts
Reference number 504.5...
Length of item in mm to be added to reference number, e.g.:
504.5032 = 32 mm length
504.5160 = 160 mm length

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